

Announcements



Bently Rotor Dynamics Research Corporation celebrates tenth anniversary

Bently Rotor Dynamics Research Corporation (BRDRC), a subsidiary of Bently Nevada Corporation, was formed ten years ago. The corporation conducts research on the dynamic characteristics and performance of rotating machinery. The purpose of this research is to develop diagnostic tools for vibration monitoring, identification, and correction of machinery malfunctions. BRDRC uses its technical resources to achieve practical solutions to machinery behavior problems in industry.

Most of the results of this research have been presented at national and international conferences and symposia. In the last ten years, BRDRC has published over 150 papers in technical magazines, conference proceedings, or as BRDRC reports. Copies of these papers are available upon request.

BRDRC's staff includes Donald E. Bently, President and Senior Research Scientist, Agnes Muszynska, Senior Research Scientist, and a staff of knowledgeable scientists and engineers. As the first user of Bently Nevada products, BRDRC's staff evaluates products and suggests improvements to Bently Nevada's Engineering Department. Many of these suggestions are incorporated into our products, such as the Digital Vector Filter 3, Acceptance Region Software, ADRE® for Windows™, and Transient Data Manager®2. BRDRC personnel, along with Bently Nevada's Machinery Diagnostics Services, consult with customers on their machinery problems.

During the past years, BRDRC research projects have included:

- Physical perturbation testing technology using both nonsynchronous sweep frequency input forces and con-



Dr. Agnes Muszynska and Donald E. Bently celebrate the tenth anniversary of Bently Rotor Dynamics Research Corporation at the Turbomachinery Symposium in Dallas, Texas on 14 September 1993.

Photo by Rick Weatherly, Squire Haskins Photography

stant forces on rotating shafts to identify rotor/bearing/seal system dynamic stiffness components.

- Revision of fluid dynamic force models in lightly-loaded bearings and seals and derivation of the key stability factor, the fluid circumferential average velocity ratio (λ).

- Multimode modeling of rotors with fluid interaction. Discovery of fluid whirls and fluid whips of higher modes. Improvements in stability predictions. Application of computer graphics in stability evaluation.

- Dynamic effects of rotor-to-stationary part rubbing.

- Dynamic behavior of rotor/bearing/stator systems with intermittent rubbing or intermittent looseness in stationary or rotating joints, characterized by orderly, harmonic, and chaotic vibrations.

- Continuation of leadership in the early detection of cracked rotors.

- Torsional/lateral coupled vibrations and their significance in shaft crack detection.

- Finite Element Modeling of rotor/bearing systems correlated with measured data to enhance modal identification procedures.

Mr. Bently and Dr. Muszynska actively participate as lecturers and/or workshop instructors during Bently Nevada seminars in Minden, Nevada, mainly at the Machinery Diagnostic seminars and at BRDRC organized Advanced Machinery Dynamics Seminars. They also review and update all Bently Nevada seminar manuals and demonstration rotor rigs.

Both have lectured at universities throughout the world and have received many awards. Two of Dr. Muszynska's papers received the "Best Paper of the Year" Awards from The American Society of Mechanical Engineers and the Society of Experimental Mechanics. The research on rotor-to-stator rubbing was recognized by NASA, which presented its Invention/New Technology Award to BRDRC.

In September 1992 and January 1993, Mr. Bently visited Moscow and St. Petersburg, where his hosts were Russian scientists who work in research institutes and universities. Mr. Bently was recently made a Foreign Member of the Russian Academy of Engineering in St. Petersburg and was made a Foreign Scholar of Tsinghua University in the People's Republic of China.

During the past five years, Dr. Muszynska has served as Associate Editor of the Transactions of the ASME Journal of Vibrations and Acoustics. She also serves as Vice-Chairperson of the International Symposia on Transport Phenomena and Dynamics of Rotating Machinery.

NASA, the U.S. Air Force, rotating machinery manufacturers, the chemical and petrochemical industries, power plants, and research labs have all benefited from BRDRC's research. We are very proud of the contributions that BRDRC has made during the last ten years. ■